DOCUMENT RESUME

ED 469 074 SE 065 721

TITLE	Measuring Student Achievement: The Impact of Standardized Testing on Equity and Excellence in Mathematics. Weaving Gender Equity into Math Reform.
INSTITUTION	TERC, Cambridge, MA.
PUB DATE	2001-00-00
NOTE	20p.
AVAILABLE FROM	For full text: http://www.terc.edu.
PUB TYPE	Guides - Classroom - Teacher (052)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	*Equal Education; *Educational Change; Educational Quality; Elementary Education; *Mathematics Education; *Standardized Tests

ABSTRACT

This paper describes how to conduct a session to address the increasing presence of standardized testing and its impact on reform in mathematics classrooms. A brief history of testing and the impact of testing on teaching and learning are presented. Focusing on the consequences for educational equity that come from conducting state and national tests, some of the reasons behind the test score gaps between whites and students of color, between students from urban districts and those from suburban ones, and between lower- and middle/upper-class students are investigated. Overheads and sample problems are included. (KHR)

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ED 469 074

Measuring Student Achievement: The Impact of Standardized Testing on Equity and Excellence in Mathematics

This session is intended to address the increasing presence of standardized testing and its impact on reform mathematics classrooms. The beginning of the session covers a brief history of testing as well as the impact testing is having on teaching and learning. We will then consider the reasons why we have standardized testing, what we can (and can't) learn from the tests, and some of the factors that influence how a student performs on such tests. The last part of the session deals with ways to help students prepare for standardized tests.

A major focus of this session is on the consequences for educational equity that come from conducting state and national tests. The growth of standardized testing has shined a spotlight on the test score gaps between Whites and students of color, between students from urban districts and those from suburban ones, and between lower- and middle/upper-class students. This session will investigate some of the reasons behind these gaps, and will give classroom teachers the tools to even the testing playing field for diverse groups of students.

This session is intended to be used with a wide range of audiences - teachers, staff developers, administrators and district leaders, and others. Given this, it may be important to adapt the session depending on the audience. Some groups, for example, will want to spend more time on the last activity (looking at sample test questions). Others may be more focused on the distinction between norm- and criterion-referenced tests or the ways testing impacts teaching and learning. Recognizing the needs of the audience and adapting appropriately may be particularly important during this session.

Preparing for the session:

Become familiar with the following pieces of the session:
Overhead 1: Opening quote from Alfie Kohn
Overhead 2: Texas data
Overhead 3: Norm- and criterion-referenced tests
Overhead 4: Chicago data
Overhead 5: Helping students prepare for tests

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Make copies of the following:
Handout 1: "Why Standardized Tests Are Bad" by Terry Meier (overview of equity issues in testing)*
Handout 2: Resources on Standards and Assessments*
Handout 3: Sample math problems
Handout 4: Guiding questions on helping students prepare for tests
Handout 5: "Preparing For Standardized Tests" available at
http://www.lab.brown.edu/investigations/spotlight/archive/preptest.html

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BEST COPY AVAILABLE

Read these for background information (you may also want to make copies of Articles 1 & 2 for participants):

Article 1: "The Forgotten History of Eugenics" by Alan Stoskopf available in *Failing Our Kids* or online at http://www.rethinkingschools.org/Archives/13_03/eugenic.htm

Article 2: "Norm- and Criterion-Referenced Testing" available at http://www.ed.gov/databases/ERIC_Digests/ed410316.html

Article 3: *Education Week* tables with assessment information for each state available at http://www.edweek.com/sreports/qc01/ under "Standards-related Tables"

*Handouts 1 and 2 and Article 1 must be reproduced from *Failing Our Kids: Why the Testing Craze Won't Fix Our Schools*, published by Rethinking Schools, Ltd. *Failing Our Kids* can be ordered for $8 by calling 1-800-669-4192 or by visiting the Rethinking Schools website at http://www.rethinkingschools.org.

Activity 1: Introduction (10 min.)

Opening with the following quote on Overhead 1:

"Our children are tested to an extent that is unprecedented in our history and unparalleled anywhere else in the world... The result is that most of today's discourse about education has been reduced to a crude series of monosyllables: 'Test scores are too low. Make them go up.'"
- Alfie Kohn, *The Case Against Standardized Testing*

How many of you recognize the sentiment that Alfie Kohn is talking about in your school or district? (Participants raise their hands)

Standardized testing is playing an increasingly large role in how we educate our students. The use of high-stakes tests in particular (such as requiring a student to pass a test before moving on to the next grade or graduating from high school) is something teachers in many states must deal with.

This session will cover the reasons why we have standardized testing, some of the equity issues involved, and ways teachers can help prepare students for tests.

By way of starting the session off, the leader may want to briefly cover a history of standardized testing in the United States. This will help set a context for the current trends in testing, and shows how some of the equity issues today had their roots in the origins of testing. Read Article 1 ("The Forgotten History of the Eugenics Movement") for more detailed information.

Before we talk about the current push for standardized testing, let's first look at the origins of testing here in the United States.

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The first standardized tests given in this country came about during the early part of this century. Lewis Terman, an educator at Stanford University and the principle designer of the Stanford-Binet intelligence test, advocated for the use of IQ testing as a way to track students. By the mid-1920s he had convinced many school districts to use high-stakes tests to sort out the "inferior" students for special education and to identify "superior" individuals for "gifted" programs. Underlying the tests was a belief Terman held that people from certain racial backgrounds, namely Native Americans, Mexican Americans, and African Americans, were intellectually inferior due to their genetic code. If this seems like an outlandish statement, keep in mind that this idea was revisited and supported seventy years later by Charles Murray and Richard Herrnstein in their book *The Bell Curve*.

The leader may want to read the following quote (taken from Article 1) from Lewis Terman's 1916 book *The Measurement of Intelligence*.

"Among laboring men and servant girls there are thousands like them [feebleminded individuals]. They are the world's 'hewers of wood and drawers of water.' And yet, as far as intelligence is concerned, the tests have told the truth. No amount of school instruction will ever make them intelligent voter or capable voters in the true sense of the word.

The fact that one meets this type with such frequency among Indians, Mexicans, and Negroes suggests quite forcibly that the whole question of racial differences in mental traits will have to be taken up anew and by experimental methods."

This quote illustrates the racist assumptions behind the standardized testing movement at the beginning of this century. Links can be made between these ideas and the consequences of high-stakes testing today with its patterns of racial segregation through tracking/graduation rates/retention.

Activity 2: The impact of testing (30 min.)

So the original purpose for giving standardized tests was to sort students according to perceived ability. This still happens today - students are tested and then placed into different "tracks," or held back a grade, or put into an accelerated program, or kept from graduating, and so on. Many of these uses are the kinds of policies people refer to when they talk about "high-stakes" testing. What are the effects of high-stakes testing in your school and district, particularly in mathematics?

The group brainstorms a list together. Different states, and even different districts within one state, will vary in their answers. Refer to the *Education Week* tables for a current list of states with some form of high-stakes testing. Participants may want to turn this part into a time to complain about testing policies; while it's important to let them "vent", the purpose of this discussion is to gain a broad picture of some of the issues involved.

Some possible answers participants might give include:

- less time spent on the curriculum and more time teaching to the test

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- students dropping out of school to avoid being "flunked out" by the test
- students aware of what they are expected to know in math
- high expectations for all students enforced
- monetary rewards/penalties to teachers and schools based on test results
- more time devoted to computation instead of problem solving skills
- students are tracked according to their scores on a single test
- students are only taught the math content that is on the test
- students are discouraged from inventing their own strategies because those strategies may not be as "efficient" (of particular concern for timed tests)
- money directed to tests and prep materials instead of good curriculum materials
- government threatening to shut down schools that don't perform well
- students of color disproportionately failing tests and not receiving a diploma or passing on to the next grade
- test prep industry popping up - will further advantage more affluent students

Some of these changes have a substantial impact on equity in education. Which students have access to out-of-school test prep material? Which students are placed into lower tracks? Which students are not receiving their diplomas because of their scores on a standardized test? It's important to be explicit with participants about the equity impact of high-stakes testing, since much of the popular rhetoric talks about "high standards for all." Pass out Handout 1 ("Why Standardized Tests Are Bad").

Show Overhead 2 (Texas data):

What we are seeing in the implementation of high-stakes testing in many states is that the inequities between students are growing larger, not smaller. Data from Texas illustrates this point. Texas' accountability exam TAAS has been a requirement for graduation since 1992-93. In 1998, 70% of all students passed the grade 10 TAAS exam. When we break that number down by racial group, we see that 85% of White students, 55% of Black and 59% of Latinos passed the exam. The dropout for Black and Latino students also increased significantly since the implementation of the graduation requirement for TAAS. Just 50% of minority students and 70% of White students in Texas have been progressing from grade 9 to high school graduation since the initiation of the TAAS testing program (dropout rates prior to TAAS ranged from 70-78% for White students and 56-59% for students of color). In other words, the use of this high-stakes test has created deep divides between students who receive a high school diploma and those who don't. And it is students of color who are by and large being negatively impacted by the exam's high-stakes requirements.

Pair up with the person next to you and spend four minutes discussing your reactions to this data.

Ask participants to make sure each person has a chance to speak and to listen reflectively. It may be helpful to call out when half the time has passed so that people will know when to switch. Share back as a whole group.

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Background information: The TAAS tests are criterion-referenced exams intended to shift the focus of assessment from "minimum skills to academic skills" and to test "higher-order thinking skills and problem solving ability." Students in grades 4, 8 and 10 take TAAS Reading, Mathematics and Writing tests in the spring of each year. The tests are mostly multiple-choice in format. The numbers of questions varies somewhat across grade level versions, with the grade 10 (or exit level) versions contain 48 reading questions, 60 math questions and 40 writing questions. The TAAS writing test also includes an open-ended question to which students must write their answers. The State Board of Education is mandated to rate the performance of schools and school districts according to a set of "academic excellence indicators," including TAAS results, dropout rates and student attendance rates. Schools are eligible for cash awards for high ratings; and if they are rated as low performing twice in a row, they are subject to sanctions from the Texas Education Agency, including possible closure.

1998-99 Texas data for K-12 Public School Students

Number enrolled: 3,808,422	Racial/Ethnic Background:
Percent in Title I schools: 56.1%	White: 44.1%
With IEPs: 12.3%	Black: 14.4%
Percent in limited-English proficiency programs: 13.5%	Hispanic: 38.6%
	Asian/Pacific Islander: 2.5%
Percent eligible for free/reduced lunch: 45.0%	American Indian/Alaskan Native: 0.3%
Per-pupil expenditures: $5,765	

The leader talks about some of the reasons why we have standardized tests and the kinds of tests that exist. Information is presented on the difference between "norm-referenced tests" (also referred to as NRT) and "criterion-referenced tests" (also referred to as CRT). For more information on this, read Article 2 ("Norm- and Criterion-Referenced Testing").

Background information on NRTs and CRTs that may be useful:
NRTs: Test questions are piloted with a norm group; their results on the pilot questions determine if a question is part of the official test or if it's thrown out. The goal of this norming process is to include a few questions most everyone can answer, some questions that about half the test takers get right, and a few questions that only the students in the highest percentile will get correct. Examples of this kind of test are the Iowa Test of Basic Skills (ITBS), the California Achievement Test (CTB), the SAT, and the Metropolitan Achievement Test.

CRTs: This type of test is not designed to compare students to one another in the way a NRT does. Instead it measures how well a student has mastered content that is tied to a particular standard. There is no bell curve used to rank students. Examples of the way a score is reported include: a scale of 0-5; with terms such as "basic, proficient, or advanced"; or numbers that correspond to ratings such as "exceeds the standards, meets the standards, or does not meet the standards." An example of a national CRT is the National Assessment of Education Progress (NAEP).

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Show Overhead 3 (Norm-referenced and criterion-referenced tests)

There are two kinds of tests that are used today - the norm-referenced test (or NRT) and the criterion-referenced test (or CRT). NRTs are "designed to highlight the achievement differences between and among students to produce a dependable rank order of students across a continuum of achievement from high achievers to low achievers." This rank order is often represented by a bell curve (draw a bell curve if participants don't seem to know what this is) and is used to compare students to one another. Test content is chosen based on pilot testing done with a group of students (they are supposed to represent the "norm").

CRTs are instituted in order to see "what test takers can do and what they know, not how they compare to others [They] report how well students are doing relative to a pre-determined performance level on a specified set of education goals or outcomes included in the school, district, or state curriculum." Scores are represented in a variety of ways and usually have a cut-off point that students must pass. Test content is chosen based on how well it matches a school, district, or state's curriculum - not how well it ranks students.

The leader poses the following questions to the group:

Some of the ways testing has impacted learning are positive, while other ways are perhaps unintended negative consequences. This begs the questions: Why do we have standardized tests today? What do we learn from them? What factors play a role in influencing how students do on a standardized test, especially on a math exam? Let's try to include in this discussion a look at the complex ways the in-school and out-of school factors interact with one another, rather than treating these factors as disconnected from one another.

The group brainstorms a list together. The leader may want to record the answers on chart paper or an overhead. Making two columns - one for positive effects and one for negative effects - can help participants sort through the impact of testing. Here are some of the things that teachers may mention:

- Tests can be used as a way to measure students' progress
- Tests can help compare how different schools are performing
- Test scores can show disparities between classrooms, schools, or districts
- Tests can be a common yardstick (a way to compare two students from different schools with an "objective" measure)
- Tests can show gaps in learning
- Tests can make schools accountable
- Tests can demonstrate whether or not students are meeting state standards
- Tests can help sort students by "ability" level

For the question of what influences how students do on standardized tests: It's important to list factors in school and outside of school. Please note that the items listed below

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have different degrees of influence on students' test performance, and that many of the factors interact with one another to create or hinder student success. There is often a statistical relationship between demographic backgrounds and test scores. This does not mean though, that all students from a certain background will perform at a certain level on an exam. There are many examples of students who have succeeded - often with a teacher's help - regardless of socioeconomic background. The leader may want to talk about examples she has seen of this. Over time people may come to make assumptions about how a student will do on a state assessment given his or her race, gender, family background, or other characteristic. The purpose of this activity is not to reinforce such assumptions, but rather to tease out the spectrum of things that play a role in that final number that is reported as a score. The goal is to get at the underlying reasons why these connections exist. Some possible answers participants might give include:

- if test is aligned with the curriculum
- how completely the curriculum is being implemented
- the pressure/stakes placed on students related to their test performance
- cultural relevancy of the test to a student's background
- rigorous curriculum in the classroom
- whether the test is timed or untimed
- students' exposure to the types of questions on the test
- a student's language of origin
- whether or not the test represents multiple learning styles

If participants do not list all of these factors, the leader may want to add them to the brainstormed list. The leader should point out that the teacher or school administrator is in control of some of these factors; other factors are beyond their control.

These are a few of the things we learn about students by testing them; they represent many of the reasons politicians and administrators give for why we should be testing students. However, some people, especially those concerned about the impact testing has on different groups of students, have argued that high-stakes testing has resulted in the inequities in education to grow larger, not smaller.

Many educators and advocates see the trend towards standardized testing as a civil rights issue. They are concerned about the large numbers of low-income students, student of color, and English as a Second Language learners who are being shut out of educational opportunities because of an emphasis on high stakes test scores as the only measure of educational success. There is a movement right now to do something about this. If you're interested in figuring out what you can do about it, then a starting point might be to get in contact with one of the groups listed on this handout.

Pass out Handout 2 (Resources on Standards and Assessments).

Show Overhead 4 (Chicago data):

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Students come to the classroom with many different levels of preparation. Teachers can play a significant role in leveling the playing field for all the students in their classrooms regardless of a student's background. The last part of this session will cover some of the things you can do to help students on standardized tests.

The best way you can help students prepare for standardized tests is to fully implement a reform math curriculum. A comprehensive study of students in Chicago Public Schools conducted by the Consortium on Chicago School Research supports this point. The scores on the Iowa Test of Basic Skills (ITBS) of 110,000 students were compared from 1996 to 1997. In schools where teachers used interactive instruction frequently, students learned 5.1 percent more than the city average in mathematics. However, in schools where interactive methods were used less frequently, students learned 4.5 percent less in mathematics. Although the one-year advantage may seem rather small, the effect can accumulate - over the eight elementary school grades the effect in mathematics amounts to more than half of an additional year of learning.

The study sampled 110, 775 Chicago Public School students in grades 2-8. An equal number of teachers reported using interactive versus didactic instruction.

Here is a chart describing the two types of instruction:

Didactic	Interactive
Teachers usually	***Teachers usually***
• Lecture or demonstrate to students	• Coach, listen, and guide students
• Pose questions that ask for single, short answers	• Pose questions that ask for explanation and which may have multiple answers
• Assess students on correctness of answers	• Assess how students arrived at answers
• Determine what students will study	• Provide choices in what students study
Students usually	***Students usually***
• Listen to teacher and recite answers	• Discuss answers and ideas with teacher and peers
• Try to repeat the knowledge they have been taught as it was transmitted	• Try to apply, interpret, and integrate knowledge into prior understanding
• Rarely choose what questions or topics to study	• Frequently choose what questions or topics to study

The graph shows the percentage students in interactive classrooms gained on the ITBS in relation to all the students in the survey (indicated by "City Average 1-year Gain") and in relation to students in classrooms with little interactive instruction. The figure does not give the actual score gains on the ITBS, but rather presents the information as the percentage students' scores went up compared to the city average.

Activity 3: Preparing for standardized tests (45 min.)

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To prepare for this part of the session, review the *Education Week* tables (Article 3) on the kinds of assessment in each state. These may be especially useful if participants are unclear about what kinds of tests they have in their states and the way those tests are administered.

The rest of this session will be devoted to looking at sample test questions from a variety of math assessments and discussing ways you can help the students in your classroom or school prepare for similar kinds of assessments. One thing for educators to consider is that no matter how you might feel about a standardized test, there are things you can do to help prepare your students. Part of the equity issues involved in testing is a recognition that one size doesn't necessarily fit all when it comes to test prep - some students need more support while others don't need as much. Different students also need support in different areas and with various types of questions. In much the same way that you have to individualize your classroom instruction based on student needs, it may also be useful to consider individualizing the ways you help students prepare for tests.

Keep in mind that because of time limitations right now each group will only have a chance to work with a few test items. You can also bring the guiding questions back to your schools as a way to help prepare for your state and/or district exams.

Participants break into small groups by grade level (K-2, 3-5). The leader hands each group several mathematics problems (Handout 3), some from the NAEP exam and others from the Stanford 9 exam. Participants discuss the ways they could help their students prepare for a similar kind of assessment question. Show the following questions (Overhead 5/Handout 4) to guide the group discussion:

- What are the ways the curriculum already helps students solve this problem? What are some of the gaps you may need to fill in?
- Is the format of the math problem similar to or different from what students are used to seeing? If it's different, then what are some of the things you can do in your classroom to familiarize students with the format?
- Is there any math vocabulary that some or all students wouldn't be familiar with?
- Are there any cultural assumptions/biases built into the problem? How can you help your students deal with contexts that may be new to them?
- What role do speed and efficiency play in solving this problem?
- In this grade band, how do you feel about the appropriateness of giving children standardized tests?

Participants spend 25 minutes discussing these questions for at least two of the assessment items. Then everyone shares back with the whole group.

What are some strategies you talked about using?

Groups share some of their thinking. Be sure to cover strategies that address each of the guiding questions. After the discussion, you may want to point out that given the limited amount of time for the session it would be impossible to cover all the different kinds of problems that appear on standardized tests. Participants can use the guiding questions

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above to think about other types of test items and the students in their classrooms. They may also want to read the article from the CESAME web site on preparing for standardized testing (Handout 5). Though the article deals primarily with the *Investigations in Number, Data, and Space* ' curriculum, many of the ideas are applicable to other standards-based math curricula.

We've covered a lot of ground in this session. Let's spend the last five minutes doing some individual reflective writing. Answer the following question: What are two things you're going to share with colleagues, parents, administrators, politicians, or others?

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Measuring Student Achievement: The Impact of Standardized Testing on Equity and Excellence in Mathematics

Handouts and Overheads

Become familiar with the following pieces of the session:
Overhead 1: Opening quote from Alfie Kohn
Overhead 2: Texas data
Overhead 3: Norm- and criterion-referenced tests
Overhead 4: Chicago data
Overhead 5: Helping students prepare for tests

Make copies of the following:
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Overhead 1

"Our children are tested to an extent that is unprecedented in our history and unparalleled anywhere else in the world...The result is that most of today's discourse about education has been reduced to a crude series of monosyllables: 'Test scores are too low. Make them go up.'"

- Alfie Kohn, ***The Case Against Standardized Testing***

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Overhead 2

- **Passing rates for the 1998 grade 10 TAAS exam:**

85% of White students passed
55% of Black students passed
59% of Latino students passed

- **50% of minority and 70% of White students in Texas have been progressing from grade 9 to high school graduation since the initiation of TAAS**

Source: Walt Haney. (2000). "The Myth of the Texas Miracle in Education" in *The Education Policy Analysis Archives*, Vol. 8, No. 41.

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Overhead 3

Norm-referenced tests are "designed to highlight the achievement differences between and among students to produce a dependable rank order of students across a continuum of achievement from high achievers to low achievers."

Criterion-referenced tests are instituted in order to see "what test takers can do and what they know, not how they compare to others [They] report how well students are doing relative to a pre-determined performance level on a specified set of education goals or outcomes included in the school, district, or state curriculum."

- **From "Norm- and Criterion-referenced Testing" by Linda Bond, ERIC Digest, 1996.**

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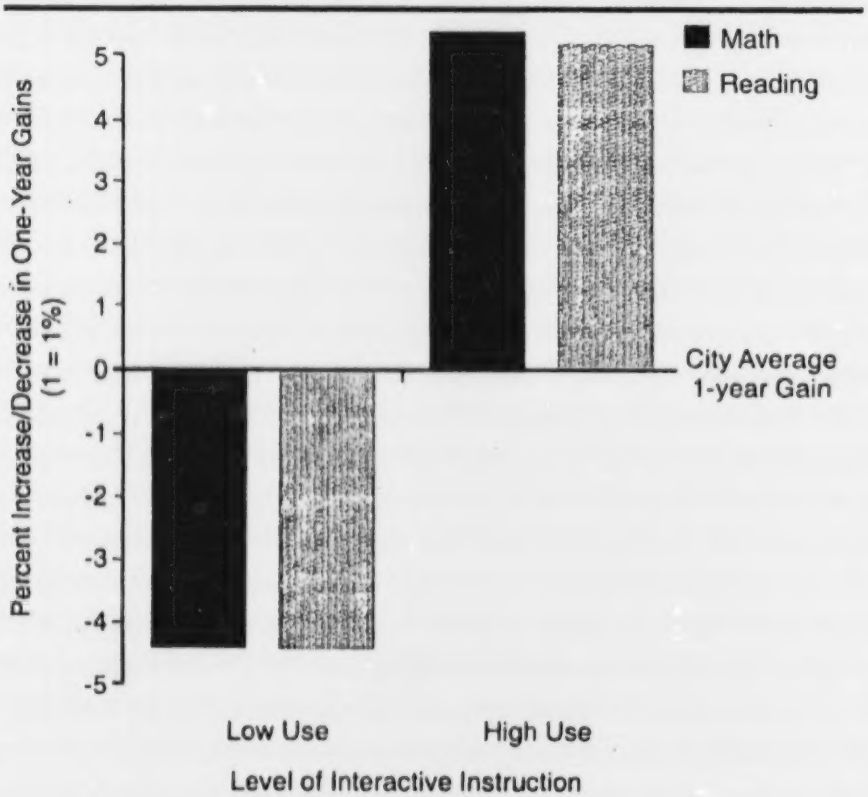
Overhead 4

Students Learn More When Use of Interactive Instruction is High: One-Year Gains in Math and Reading Achievement, Compared to Chicago's Average



Source: Julia Smith, Valerie Lee, and Fred Newmann. (2001) "Instruction and Achievement in Chicago Elementary Schools." Chicago, IL: Consortium on Chicago School Research.

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Overhead 5

- **What are the ways the curriculum already helps students solve this problem? What are some of the gaps you may need to fill in?**

- **Is the format of the math problem similar to or different from what students are used to seeing? If it's different, then what are some of the things you can do in your classroom to familiarize students with the format?**

- **Is there any math vocabulary that some or all students wouldn't be familiar with?**

- **Are there any cultural assumptions/biases built into the problem? How can you help your students deal with contexts that may be new to them?**

- **What role do speed and efficiency play in solving this problem?**

- **In this grade band, how do you feel about the appropriateness of giving children standardized tests?**

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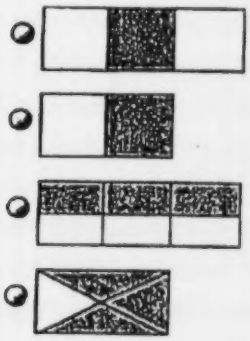
① **Which of these figures has $^1/_3$ shaded?**



ISAT (Grade 3)

② **Herb bought a candy bar for $0.75 and a package of gum for $0.50. What else do you need to know to find out how much change Herb should receive?**

- How many sticks of gum were in the package.
- Where he bought the candy and gum.
- The size of the candy bar.
- How much money he gave the clerk.*

Stanford 9 (Grade 3)

③ **Tom has been saving his allowance for a month. If he continues to save the same amount each week, what will his total savings be by week 4?**

	Week 1	Week 2	Week 3	Week 4
Total Saved	$2.25	$4.50	$6.75	?

- $3.50
- $5.50
- $8.00
- $9.00

ISAT (Grade 3)

④ **The value of which number is 500 greater than 1123?**

a) 1523 d) 1678
b) 1600 e) NH
c) 1623

Stanford 9 (Grade 3)

⑤ **Which would replace the ☐ to make the number sentence true?**

$3 \times (\square \times 1) = (3 \times 4) \times 1$

a) 3 d) 13
b) 4 e) NH
c) 12

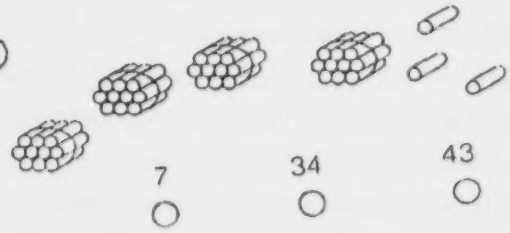
Stanford 9 (Grade 3)

⑥ Mrs. Bolton is checking to see how many yellow and red roses are in her garden. How can she tell how many roses there are?

- ○ Subtract the number of red roses from yellow roses.
- ○ Subtract the number of roses from other flowers.
- ○ Add the number of yellow and red roses.

Stanford 9 (Grade 2)

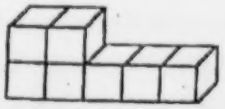
⑦

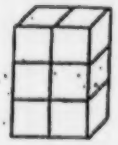


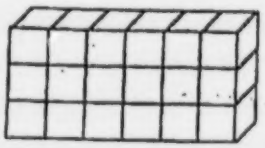
Stanford 9 (Grade 1)

① This figure holds 3 cups. Which group of figures shows a capacity of 18 cups?

A)

B) 

C) 

D) 

Kansas Math Assessment (Grade 4)

② **There were 10 floats in the parade. Six balloons were needed to decorate each float and 15 balloons were needed to decorate the judges' stand. Altogether how many balloons were needed?**

Ⓕ 21
Ⓖ 31
Ⓗ 60
Ⓙ 75
Ⓚ NH

Stanford 9 (Grade 4)

③ **Find the value of the variable y.**

$x - y = y$
$x = 8$

- 32
- 16
- 4
- 3
- 2

ISAT (Grade 5)

④ N stands for the number of stamps John had. He gave 12 stamps to his sister. Which expression tells how many stamps John has now?

Ⓐ $N + 12$
Ⓑ $N - 12$
Ⓒ $12 - N$
Ⓓ $12 \times N$

NAEP (Grade 4)

⑤ **Fatima used half of a loaf of bread to make 6 sandwiches. How many slices of bread were left?**

a) 3
b) 12
c) 24
d) 6
e) NH

ⓐⓑⓒⓓⓔ

Stanford 9 (Grade 5)

⑥ **Which is both a factor of 12 and a multiple of 6?**

a) 2
b) 3
c) 4
d) 6
e) 8

⑦ **Which number falls between 2 and 3?**

f) $\frac{1}{3}$
g) $\frac{2}{3}$
h) $1\frac{2}{3}$
j) $2\frac{2}{3}$
k) $3\frac{2}{3}$

Stanford 9 (Grade 5)

⑧ **The width of a rectangular rug is 4 feet. If the perimeter is 20 feet, what is the length of the rug?**

- 4 feet
- 5 feet
- 8 feet
- 16 feet
- 80 feet

ISAT (Grade 5)

Handout 4

- **What are the ways the curriculum already helps students solve this problem? What are some of the gaps you may need to fill in?**

- **Is the format of the math problem similar to or different from what students are used to seeing? If it's different, then what are some of the things you can do in your classroom to familiarize students with the format?**

- **Is there any math vocabulary that some or all students wouldn't be familiar with?**

- **Are there any cultural assumptions/biases built into the problem? How can you help your students deal with contexts that may be new to them?**

- **What role do speed and efficiency play in solving this problem?**

- **In this grade band, how do you feel about the appropriateness of giving children standardized tests?**

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